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Claims

1. Use of single-stranded RNA molecule having a length from 14 - 50 nucleotides wherein at least the 14 - 20 5'most nucleotides are substantially complementary to a target transcript for the manufacture an agent for inhibiting the expression of said target transcript.
2. The use of claim 1 wherein said expression is inhibited by RNA-interference.
3. The use of claim 1 or 2 wherein said RNA molecule has a length from 15 - 29 nucleotides.
4. The use of any one of claims 1 to 3, wherein said RNA molecule has a free 5'hydroxyl moiety or a moiety selected from phosphate groups or analogues thereof.
5. The use of any one of claims 1 to 3, wherein said RNA molecule has 5'-moiety selected from 5'-monophosphate $((\text{HO})_2(\text{O})\text{P}-\text{O}-5')$, 5'-diphosphate $((\text{HO})_2(\text{O})\text{P}-\text{O}-\text{P}(\text{HO})(\text{O})-\text{O}-5')$, 5'-triphosphate $((\text{HO})_2(\text{O})\text{P}-\text{O}-(\text{HO})(\text{O})\text{P}-\text{O}-\text{P}(\text{HO})(\text{O})-\text{O}-5')$, 5'-guanosine cap (7-methylated or non-methylated) $(7\text{m-G}-\text{O}-5'-(\text{HO})(\text{O})\text{P}-\text{O}-(\text{HO})(\text{O})\text{P}-\text{O}-\text{P}(\text{HO})(\text{O})-\text{O}-5')$, 5'-adenosine cap (Appp), and any modified or unmodified nucleotide cap structure $(\text{N}-\text{O}-5'-(\text{HO})(\text{O})\text{P}-\text{O}-(\text{HO})(\text{O})\text{P}-\text{O}-\text{P}(\text{HO})(\text{O})-\text{O}-5')$, 5'-monothiophosphate (phosphorothioate; $(\text{HO})_2(\text{S})\text{P}-\text{O}-5'$), 5'-monodithiophosphate (phosphorodithioate; $(\text{HO})(\text{HS})(\text{S})\text{P}-\text{O}-5'$), 5'-phosphorothiolate $((\text{HO})_2(\text{O})\text{P}-\text{S}-5')$; any additional combination of oxygen/sulfur replaced monophosphate, diphosphate and triphosphates (e.g. 5'-alpha-thiotriphosphate, 5'-gamma-thiotriphosphate, etc.), 5'-phosphoramidates $((\text{HO})_2(\text{O})\text{P}-\text{NH}-5'$, $(\text{HO})(\text{NH}_2)(\text{O})\text{P}-\text{O}-5'$), 5'-alkylphosphonates ($\text{R} = \text{alkyl} = \text{methyl}$,

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ethyl, isopropyl, propyl, etc., e.g. $\text{RP}(\text{OH})(\text{O})\text{-O-5'}$ -, $(\text{OH})_2(\text{O})\text{P-5'}$ - CH_2 -), 5'-alkyletherphosphonates (R = alkylether = methoxymethyl (MeOCH_2 -), ethoxymethyl, etc., e.g. $\text{RP}(\text{OH})(\text{O})\text{-O-5'}$ -).

- 5 6. The use of any one of claims 1 to 5, wherein said RNA molecule is completely complementary to said target transcript optionally with exception of nucleotides that extend beyond position 20 (counted from the 5' terminus).
- 10 7. The use of any one of claims 1 to 6, wherein said RNA molecule comprises at least one modified nucleotide analogue.
- 15 8. The use of claim 7, wherein the modified nucleotide analogues are selected from sugar-backbone- and nucleobase-modified ribonucleotides and combinations thereof.
- 20 9. The use of any one of claims 1 to 8 for the inhibition of target gene expression in vitro.
- 25 10. The use of any one of claims 1 to 8 for the inhibition of target gene expression in vivo.
- 30 11. The use of any one of claims 1 to 10, wherein said RNA molecule is formulated as a pharmaceutical composition which contains a pharmaceutically acceptable carrier.
12. The use of claim 11, wherein said carrier is selected from cationic liposomes and cationic lipid formulations.
13. The use of any one of claims 1 to 12, wherein said RNA molecule is associated with biodegradable polymers or microparticles.

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14. The use of claim 13, wherein said association comprises a covalent coupling.
15. The use of claim 14, wherein said covalent coupling occurs via the 3'-terminus of the RNA molecule.
16. The use of any one of claims 10 to 15 for diagnostic applications.
17. The use of any one of claims 10 to 15 for therapeutic applications.
18. The use of claim 17 for the prevention or treatment of diseases associated with overexpression of at least one target transcript.
19. The use of claim 18, wherein the diseases are selected from tumor diseases, inflammatory diseases, infectious diseases, e.g. viral infections, degenerative diseases and autoimmune diseases.
20. A pharmaceutical composition for inhibiting the expression of a target transcript by RNAi comprising as an active agent a single-stranded RNA molecule having a length from 14 - 50 nucleotides, wherein at least the 14 - 20 5'most nucleotides are substantially complementary to said target transcript.
21. A method for the prevention or treatment of a disease associated with overexpression of at least one target gene comprising administering a subject in need thereof a single-stranded RNA molecule having a length from 14 - 50 nucleotides, wherein at least the 14 - 20 5'most nucleotides are substantially complementary to a transcript of said target gene in an amount which is therapeutically effective for RNAi.

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22. Purified human RISC having a molecular weight of from up to about 150 - 160 kDa.
23. The RISC of claim 22 comprising at least one member of the Argonaute family of proteins.
24. The RISC of claim 22 or 23 containing eIF2C1 and/or eIFC2 and optionally at least one of eIFC3, eIFC4, HILI and HIWI.
25. The RISC of any one of claims 22-24, further containing an RNA component.
26. A host cell or non-human host organism capable of overexpressing RISC.
27. A method of enhancing RNAi in a cell or an organism comprising causing said cell or organism to overexpress at least one component of RISC.
28. The method of claim 27 for screening applications.
29. The method of claim 27 for therapeutic applications.
30. An antisense siRNA precursor molecule in the form of a hairpin stem-loop structure comprising 19 to 29 base pairs in stem, wherein at least 14 nucleotides in the stem are substantially complementary to a target transcript.
31. The siRNA precursor molecule of claim 30 having a 3' overhanging end.